REMARKS

Applicants request favorable reconsideration and allowance of this application in view of the foregoing amendments and the following remarks.

Claims of 1-6, 9-14 and 17-19 are now pending in this application, with claims 1, 9, 10 and 17 being independent. Previously withdrawn claims 7, 8, 15 and 16 have now been canceled, without prejudice to or disclaimer of the subject matter recited therein. Independent claims 1 and 10 have been amended. Support for such claim amendments can be found throughout the specification, including, for example, at pages 15-16 of the specification. Moreover, previously dependent claims 9 and 17 have been rewritten in independent form to include, respectively, the salient features found in previously presented claims 1 and 10. Moreover, claims 18 and 19 have been added to further claim the subject matter previously recited in claims 9 and 17, respectively. Accordingly, no new matter has been added by these claim amendments.

At the outset, Applicants would like to address the remarks provided in the outstanding Office Action as to allowable subject matter. In the outstanding Office Action, the Examiner objected to claims 9 and 17 (as previously presented) as being dependent upon rejected base claims, but indicated that these claims would be allowable if rewritten in independent form to include all of the features of the base claim and any intervening claims from which these claims depend. Applicants would like to thank the Examiner for providing an indication of such allowable subject matter. As a result, Applicants have rewritten claims 9 and 17 in independent form, as suggested above, to overcome the Examiner's objection to these claims and place them in allowable form.

Consequently, now independent claim 9 recites a method for the immobilization of sulfur-containing molecules, wherein a large number of sulfur-containing molecules are immobilized on a surface-treated product of a gold-plated body, wherein the surface-treated product is obtained by conducting a surface treatment comprising subjecting a surface of the gold-plated body to an annealing treatment at a temperature of 350 to 790°C. This claim incorporates the salient features of claim 1.

Moreover, since claim 9 as previously presented also depended from claim 2, claim 18 has been added to encompass this additionally claimed subject matter. As a result, claim 18 recites the method of claim 9, wherein the surface treatment is conducted so as to obtain a structure in which the surface gold crystals have no less than 30% planes with (1, 1, 1) orientation.

Moreover, now independent claim 17 recites a method for the immobilization of sulfur-containing molecules, wherein a large number of sulfur-containing molecules are immobilized on a gold-plated body, wherein the gold-plated body is obtained by a manufacturing method comprising forming surface gold crystals from a starting material comprising a crystal growth enhancer. Consequently, claim 17 now incorporates the salient features of claim 10.

Finally, since claim 17 as previously presented also depended from claim 12, claim 19 has been added to encompass this additionally claimed subject matter. Thus, claim 19 now recites the method of claims 17, wherein the gold-plated body is obtained by adding a crystal growth enhancer to a gold plating solution, immersing an electrically conductive substrate therein, and passing an electric current through said electrically conductive substrate and said gold plating solution having the crystal growth enhancer added thereto.

In addition, the outstanding Office Action rejects claims 1-3, 5 and 6 under 35 U.S.C. § 102(b) as anticipated by both U.S. Patent No. 5,873,992 to Glezen et al. and U.S. Patent No. 4,343,684 to Lechtzin. Moreover, claims 10, 12, 13 and 14 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,614,004 to Wachi et al. Also, claims 4 and 11-14 have been rejected under 35 U.S.C. § 103(a) as being obvious over the Glezen patent or the Lechtzin patent in view of the Wachi et al. patent. Each of these rejections is respectfully traversed for the reasons provided below.

According to Applicants understanding, the Glezen et al. patent provides a method for electroplating a conductive metal onto a target conductive metal layer surface, such that the formed electroplating metal layer will have a resulting surface roughness less than the initial surface roughness of the target layer. The Glezen et al. patent suggests that a supporting substrate must be metallized to form a seed layer, and then a conductive layer can be electroplated onto the seed layer. Moreover, the Glezen et al. patent suggests that metals,

diamond, semiconductors, ceramics, thermoplastics or thermosets are all examples of supporting substrate materials that can be used.

Further, Applicants understand the Lechtzin patent to describe a method for electrodepositing karat gold upon a disposable substrate. The karat gold electroformed piece can be stress relieved by annealing at elevated temperatures for suitable periods of time and is then immersed in an acid bath to remove the metallic shell from the piece interior, thereby producing a configured shell of karat gold.

Finally, Applicants understand the Wachi et al. patent to describe an electroless gold plating solution that does not precipitate gold at high concentrations of thallium or lead compound, while retaining its effects such as increased deposition rate and larger crystalline sizes in the depositied layer. The electroless gold plating solution according to the invention contains a chelating agent. In the Background of the Invention portion of the Wachi et al. patent, it is noted that electroless gold plating solution containing thallium or lead compound are known to increase the deposition rate of gold, and help crystal growth in the deposits thus enhancing the heat resistance of the gold.

However, Applicants do not find that any of these documents, taken alone or in combination, teach Applicants' claimed invention, particularly as amended. For example, Applicants do not understand any of the cited documents to teach a method for surface treatment (or manufacture) of a gold-plated body, obtained by using electrically conductive substrates having a Ni layer on the periphery of electrically conductive materials composed of Co-Ni-Fe alloy.

That is, independent claim 1, as amended, now recites a method for surface treatment of a gold-plated body, wherein a surface of the gold-plated body obtained by using electrically conductive substrates having a Ni layer on the periphery of electrically conductive materials composed of Co-Ni-Fe alloy, is subjected to an annealing treatment at a temperature of 350 to 790°C so that a large number of sulfur-containing molecules can be immobilized thereon.

Moreover, independent claim 10, as amended, now recites a method for the manufacture of a gold-plated body, obtained by using electrically conductive substrates having a Ni layer on the periphery of electrically conductive materials composed of Co-Ni-Fe alloy, that allows a large number of sulfur-containing molecules to be immobilized on the surface thereof,

wherein surface gold crystals are formed from a starting material comprising a crystal growth enhancer.

Since a Co-Ni-Fe alloy has a thermal expansion coefficient of approximately 5×10^{-6}/°C, which is smaller than that of Ni (12.8×10^{-6}/°C) or Au (14×10^{-6}/°C), the annealing treatment causes the electrically conductive materials to thermally expand and coolingly contract to a larger degree than the Ni layer and Au for gold-plated body. Therefore, it is possible to prevent the Ni layer and the Au for the gold-plated body from cracking and breaking.

Also, since the Co-Ni-Fe alloy contains such Ni element as in the Ni layer, the adhesiveness of the Ni layer to the electrically conductive materials is strong. Moreover, the annealing treatment causes the Ni layer to diffuse into and firmly adhere to Au of the gold-plated body. Accordingly, compared to directly forming Au on the Co-Ni-Fe alloy to the gold-plated body, Au of the gold-plated body becomes more firmly adhered to the Co-Ni-Fe alloy, and the state of Au of the gold-plated body becomes good enough to resist cracking.

In view of all of the above, Applicants submit that this Amendment clearly places this application in condition for allowance, and that both the independent and dependent claims should be deemed allowable. Applicants also believe that the dependent claims are allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims.

Applicants request that the Examiner contact Applicants' undersigned representative should any matters be deemed outstanding, precluding allowance of this application. Applicants further request favorable reconsideration, withdrawal of the rejections and objections set forth in the outstanding Office Action, and an early Notice of Allowance.

Dated: April 26, 2004

Respectfully submitted,

By Natalie M. Derzko

Natalie M. Derzko
Registration No.: 48,102
COVINGTON & BURLING
1201 Pennsylvania Avenue, N.W.
Washington, DC 20004-2401
(202) 662-6000